Report from the past operation period

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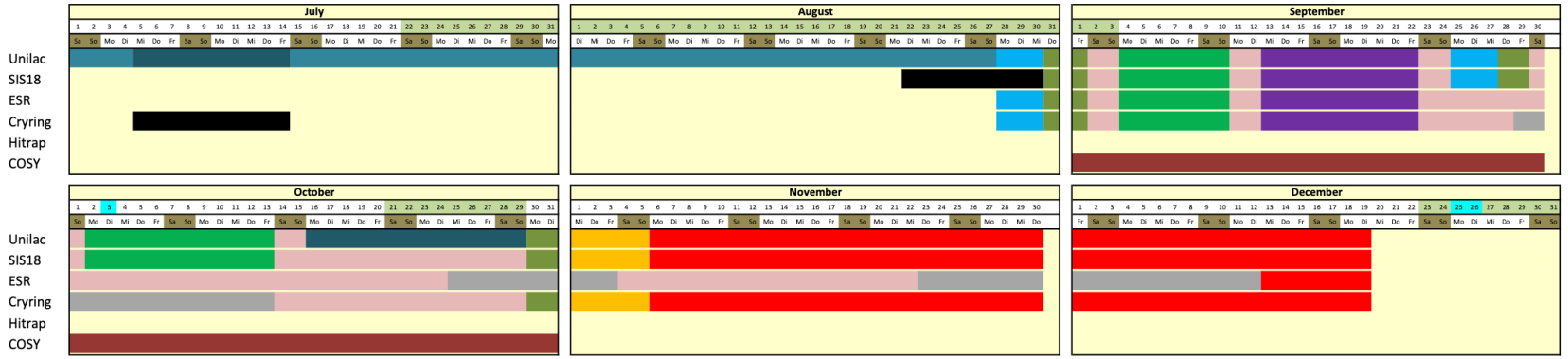
Beam Time Retreat 2024 – Do. 9:45-10:10

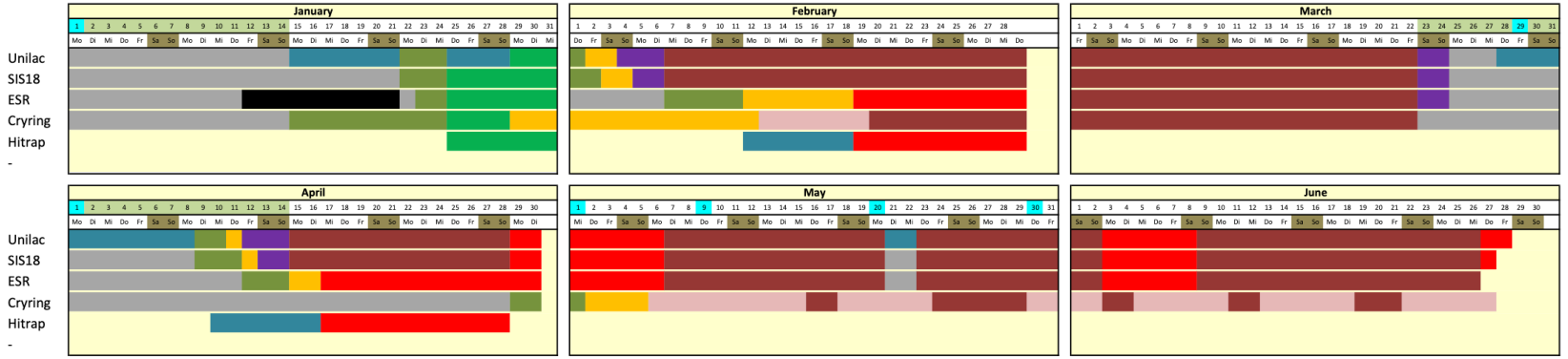
Outline

1. overview of the past operating period
2. recapitulation engineering run 2023
3. 2024 beamtime statistics
4. improvements & opportunities

Past Operation Period



2023
engineering run



2024
user beam time

Recapitulation Engineering Run 2023

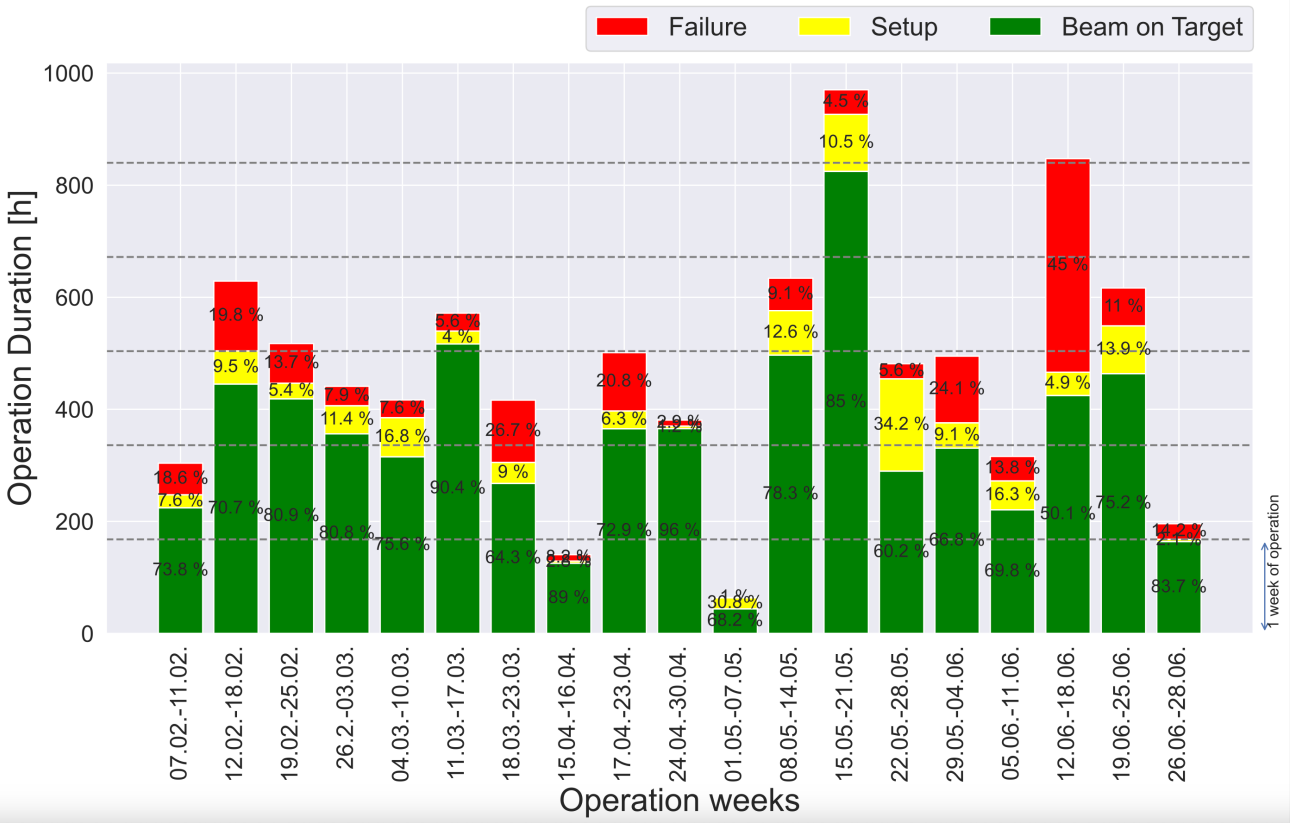
Status Engineering-Run (20.12.2023)

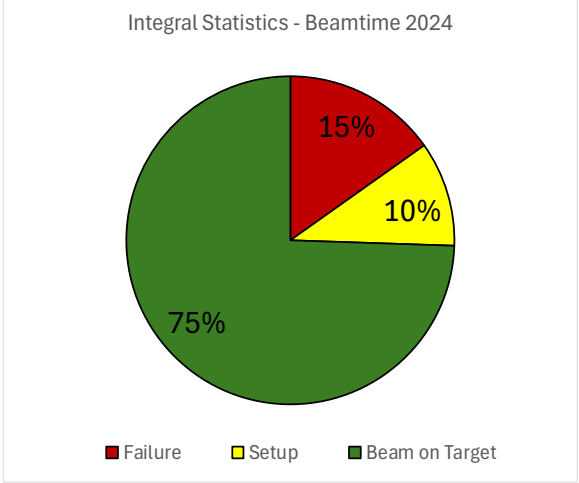
> 80%
> 50%
0 – 50%
goals achieved

Shortcut	Campaign	Goals	
MEXP	Machine Studies	Execution of prioritized 57 machine studies	●
CW	cw-Demonstrator	Commissioning cw demonstrator	●
GPAC	Cryring-Experiments	Successful implementation of prioritized PAC experiments	●
HCC	High current campaign p+	Setting and optimization of a p+ high-current beam in the SIS18 for status recording (max. BRho, slow extraction)	●
Dual-IB	Dual isotope beam development	Evaluation of the possibility of a dual-isotope operating mode at GSI	●
Pion PE	Pion production evaluation	Establishment & optimization of an operational scenario for pion production with carbon	●
U28p	U28+ High Intensity (FAIR Booster)	Establishment of a U28+ high-current beam with pulsed H-stripper and optimal use of time for machine studies	●
BP-HEST	SIS18 beam parameter	Measure SIS18 beam parameters in HEST	●
TRANS	HTA/HHT Transport	Establishment of an operational beam according to HTA (possibly also HHT), optimization of transmission and stability	●
Gasstripper	Gasstripper	commissioning and tests pulsed gas stripper	●
54Cr X8	Entwicklung Cr-Strahl	SHE 54-Cr- beam verification	●
ESR	Inbetriebnahme	ESR commissioning with beam / deceleration if possible	●
N-Pion PE II	Pion Production evaluation with N-beam	Repetition of the high-current campaign for pion production with nitrogen	●

- swiftly organized by campaign coordinators
- 57 machine studies incl. spill optimization, machine learning, ... have been scheduled
- ca. 48 h beam for HHT prior (different ions)
- ca. 9h carbon beam for FRS/HTM

Availability Statistics 2024





average parallel factor: 2.8

Beam Time 2022
beam on target: 74%
average parallel factor: 2.7

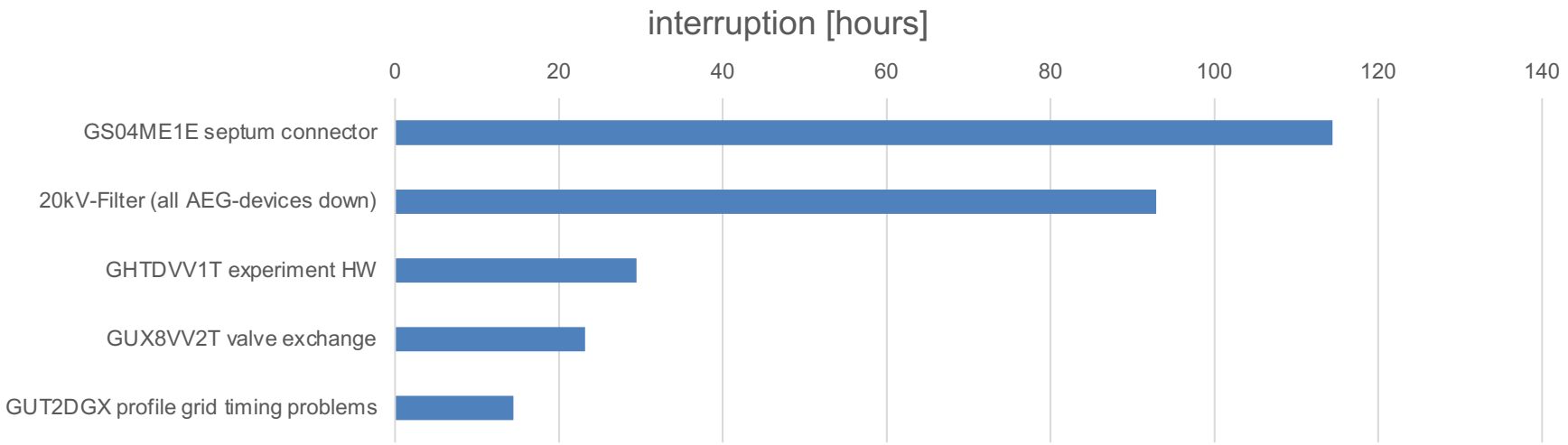
Machine Availability

Machine	Availability within chain	Availability for experiments
UNILAC	92% 	78%
SIS18	83%	
ESR		80%
HEST	99% 	90% 
Cryring		69%

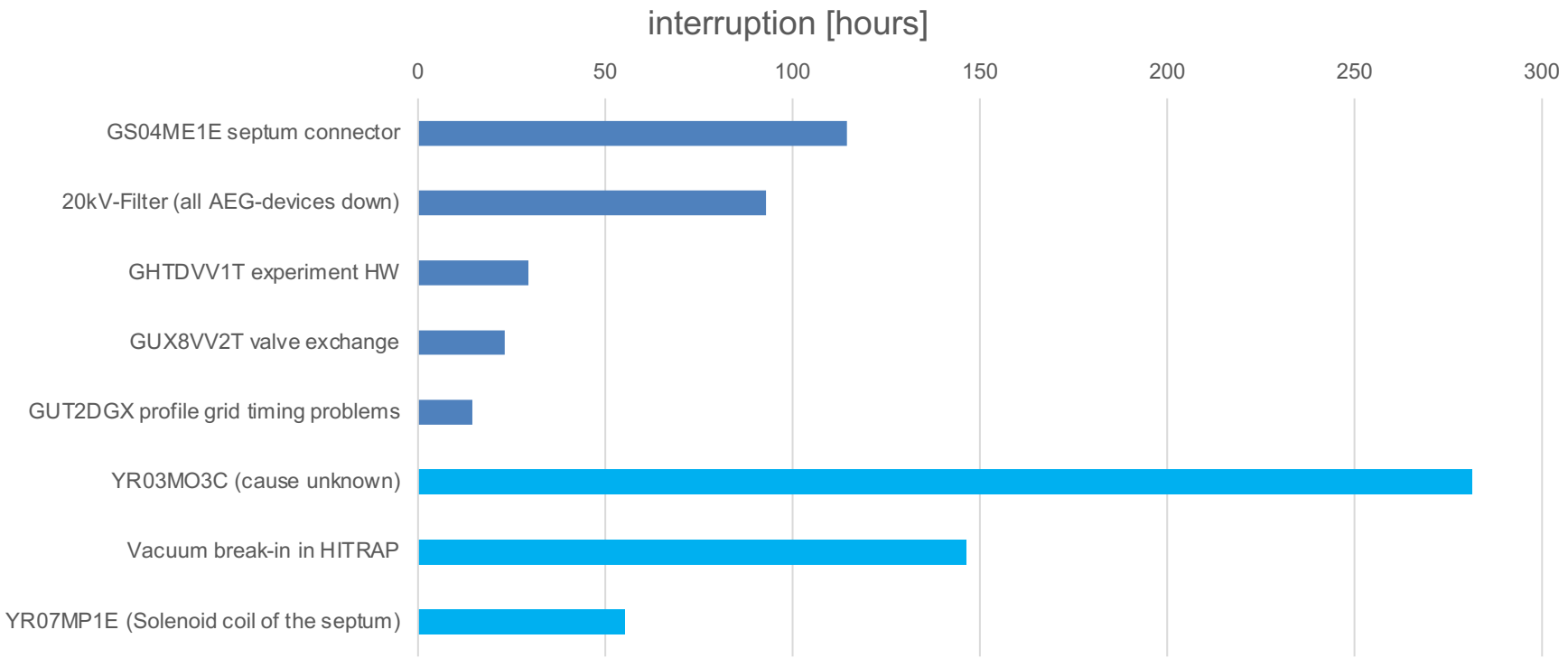
Availability as part of a chain

Availability for experiments if the machine represents the end of a chain

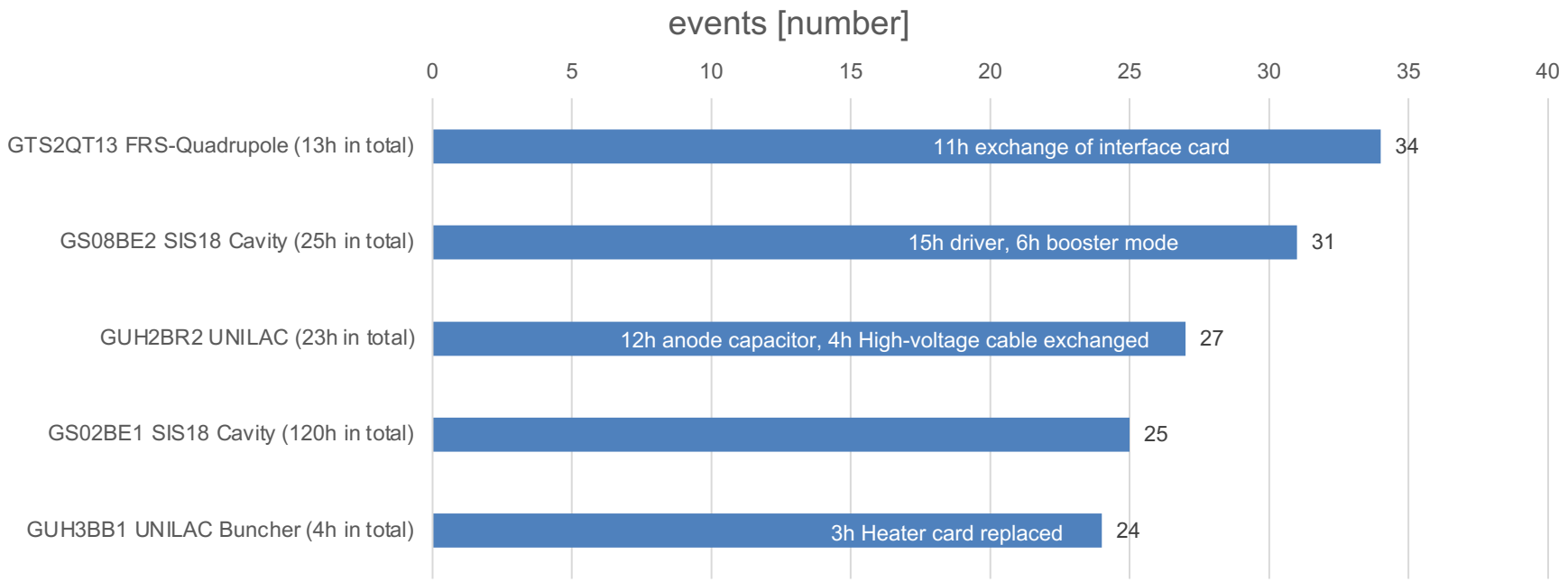
Top 5 longest single event interruptions 2024



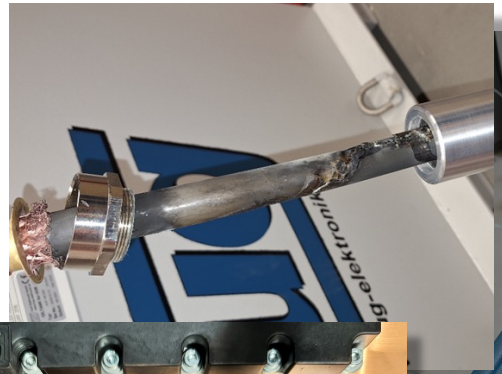
Top 5 longest single event interruptions 2024
+ “hidden” events from machine exp. / eng.-runs / etc.

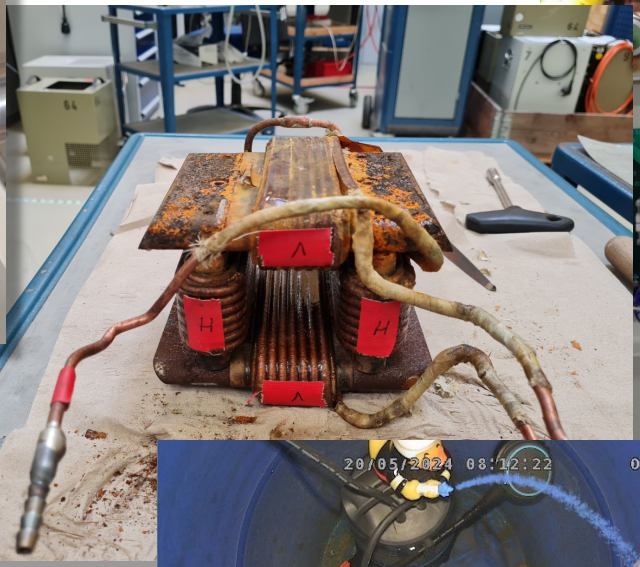


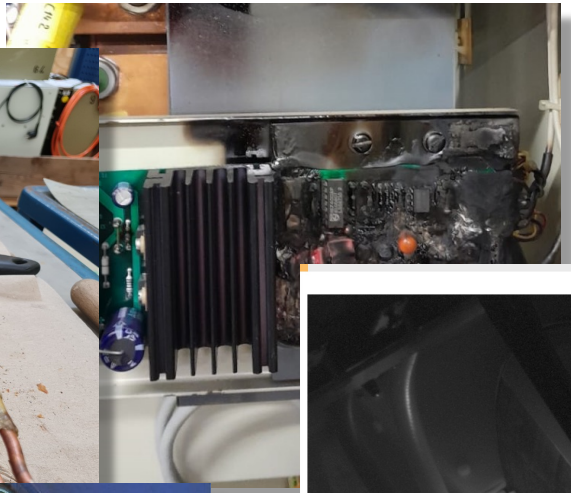
Top 5 systems that failed most frequently

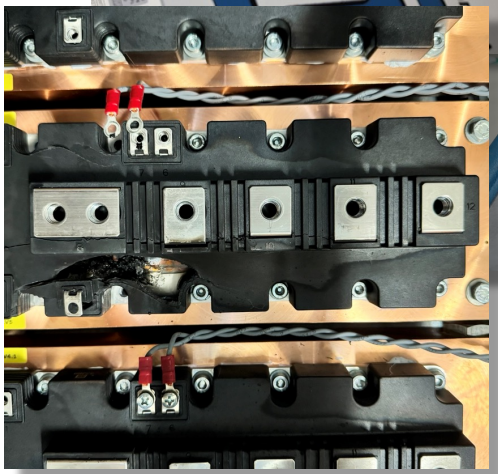


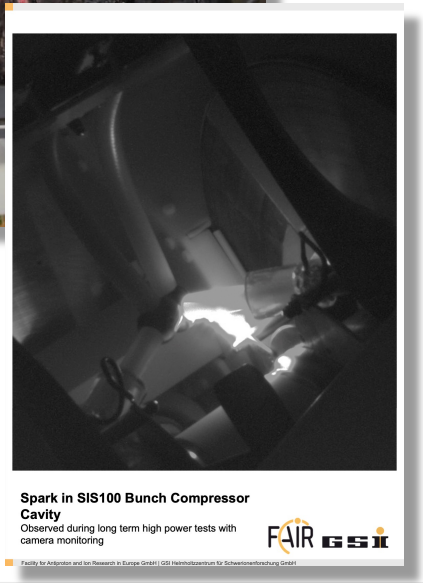
disaster pictures







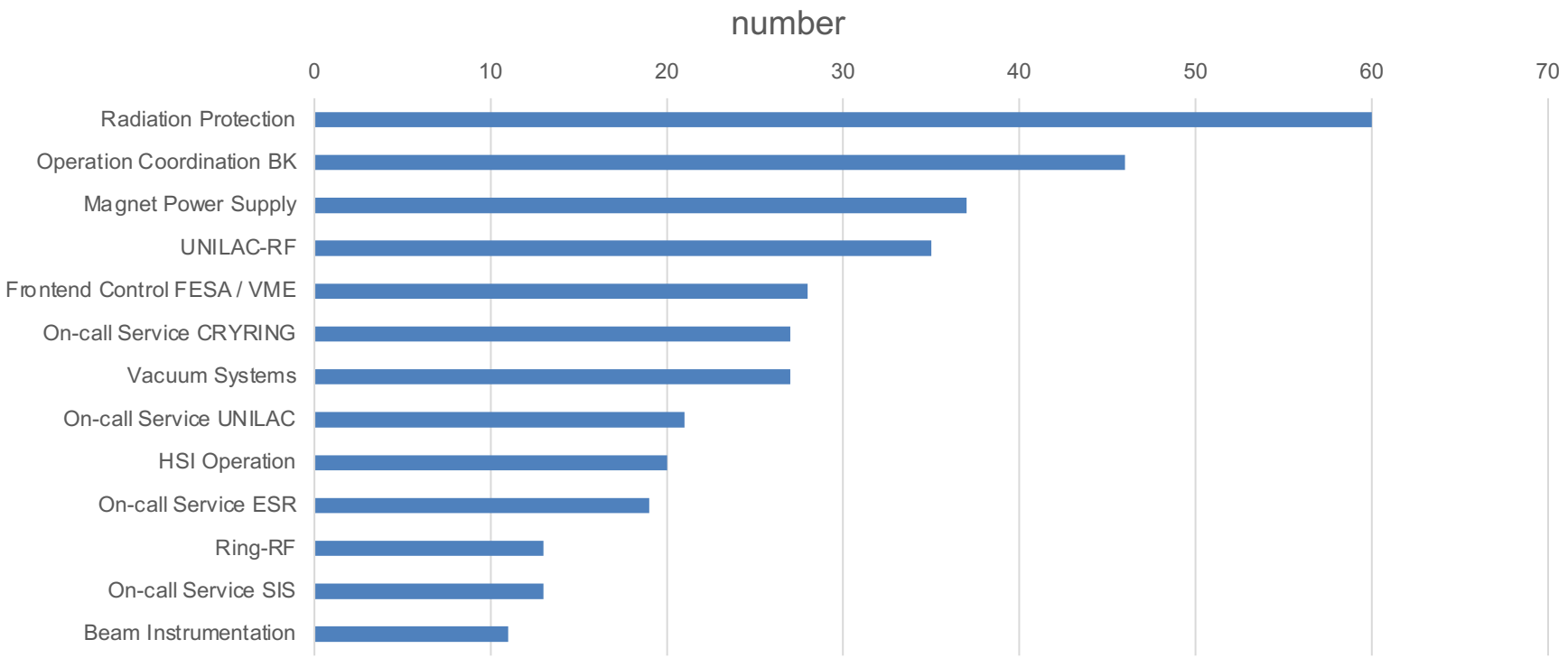




excellence in failure

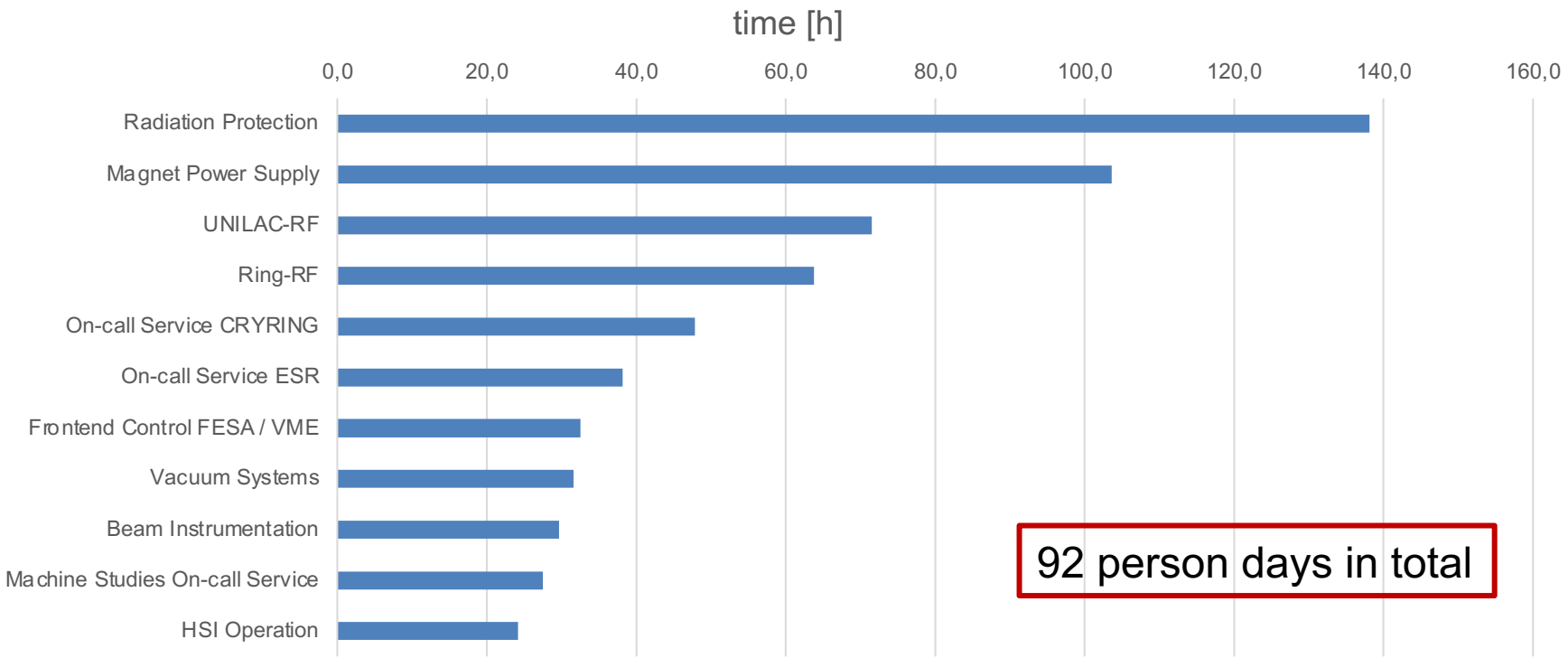
on-call service

most calls (>10) – total 423



on-call service

highest integral working time (>24h) – total 748h



Good Developments

- beam time scheduling
  - dedicated setup times
  - longer blocks with same ions
  - improved consideration of parallel operation and compatible experiments
- better and more detailed documentation in OLOG
- Cryring operation
  - improved collaboration between shift crew and machine team
- good preparation of SIS18 patterns by machine team
- control system has stabilized
- very good support by all machine-teams

Opportunities for Improvement

- machine study coordination
  - 1 coordinator instead of 3 → campaign coordination concept from engineering run
- operations coordination
  - regular check of basic SIS18 settings & experiment data in logbook
- communication of machine knowledge (e.g. SIS18 RF-setup, RF-KO, chimney setup, CO)
  - operator School Q4 2024
- setup of special operating modes at UNILAC
  - machine team has been overcharged this year and operations team unlearns skills
  - in case there are new concepts, knowledge transfer to operations team must be organized
- regular setup of standard operating modes at SIS18 by machine team
  - help with preparation and regularly check settings, but don’t do setup unless called
- certain controls aspects
  - LSA storage, only few devices achieved, digital actual-values, OP optimized UIs, infrastructure data


Thanks for the great support
during the beam time 2024